

## Abstract

A system and method for measuring the similarity of multiple-color images and for locating regions of a target image having color information that matches, at least to a degree, the color information of a template image. A color characterization method operates to characterize the colors of an image and to measure the similarity between multiple-color images. For each image pixel, the method determines a color category or bin for the respective pixel based on HSI values of the respective pixel, wherein the color category is one of a plurality of possible color categories in HSI color space. In various embodiments, the weight of the pixel may be fractionally distributed across a plurality of color categories, e.g., as determined by applying fuzzy pixel classification with a fuzzy membership function. The percentage of pixels assigned to each category is then determined. The percentage of pixels in each color category is then used as a color feature vector to represent the color information of the color image. A quantitative measurement of the color similarity between color images is then computed based on the distance between their color feature vectors. Once the color information of a template image has been characterized, a target image may be searched in order to locate regions within the target image having matching color information. In one embodiment, a coarse-to-fine heuristic may be utilized, in which multiple search stages of decreasing granularity are performed. A first-stage search may operate to identify a list of candidate match regions based on the city-block distance of the color feature vector computed using a sub-sampling scheme. These candidate match regions may then be examined in further detail in order to determine final matches.